Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Linda Manor Nursing Home

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program

Date Prepared: November 19, 2003

Table 1: Public Water System (PWS) Information

PWS Name	**Linda Manor Nursing Home**
PWS Address	**349 Haydenville Road**
City/Town	**Northampton, Massachusetts**
PWS ID Number	**1214001**
Local Contact	**Mr. David LaPlante**
Phone Number	**1-413-238-5344**

Well Name	*Source ID#*	*Zone I (in feet)*	*IWPA (in feet)*	*Source Susceptibility*
Well #1	1214001-01G	276	733	Moderate
Well #2	1214001-02G	267	688	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road de-icing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:
This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:
1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Northampton is a medium sized city in western Massachusetts. The Linda Manor Nursing Home is located on the north end of Northampton on Haydenville Road and serves a population of approximately 200 residents and staff. Although Northampton does have a municipal water system and a municipal wastewater treatment facility, the hydraulics in the water system were not conducive to serving the facility. Therefore, the nursing home utilizes two, on-site water supply wells however, wastewater is discharged to the municipal sewer system. The facility uses natural gas as a fuel source and has removed the underground storage tank that formerly stored fuel oil. The facility

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

maintains an emergency generator with a diesel fuel storage tank within a containment structure.

Well #1 is a 6-inch diameter, 300-feet deep, bedrock well and has an approved withdrawal rate of 10.4 gpm. The wells are located approximately 276 feet east of the building. Well #2 is a 6-inch diameter, 280-feet deep, bedrock well and has an approved withdrawal rate of 9.0 gpm. Well #2 is located approximately 25 feet from Well #1. Wells #1 and #2 were developed and approved through the New Source Approval Process. Although each well could pump independently, the wells currently operate simultaneously. Both wells are located with pits that have on occasion had standing water in the pit. The facility also maintains a third well for fire protection that is located in the front of the facility; that well is not connected to the potable water supply system. At the time of the assessment, there was no cap on the third well. Subsequently, the maintenance operator had a temporary cap installed on the casing.

The Zone I is the protection area immediately surrounding the well while the Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual recharge area (Zone II) has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii for Well #1, based on an approved withdrawal rate, are 276 feet and 733 feet, respectively. The Zone I and Interim Wellhead Protection Area (IWPA) radii for Well #2, based on an approved withdrawal rate, are 267 feet and 688 feet, respectively. Please refer to the attached map of the Zone I and IWPA.

Both wells withdraw water from the bedrock aquifer. The complex is located on an upland area underlain by apparently a thick layer of till. Driller's logs refer to 155 feet of hardpan over bedrock. Geologic maps of the area identify the bedrock as phyllite and schist of the Gile Mountain Formation. Although there is a thick till layer, there is no clear evidence that the till acts as a continuous confining unit in the immediate area. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer.

The water does not receive treatment. For information on current water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Refer to Table 2

Table 2: Table of Activities within the Water Supply Protection Areas for Both Sources

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Zone I	-	-	-	Contact DEP prior to conducting any work in Zone I or expanding the system.
Internal transportation/parking	Both	Both	Moderate	Limit road deicing materials usage and monitor parking areas.
Nursing home	No	Both	Moderate	Supply BMPs to staff regarding waste disposal
Septic system components	Both	Both	Moderate	Continue to maintain septic system and protect it from improper disposal

*** -For more information, see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website- www.state.ma.us/dep/brp/dws/.**

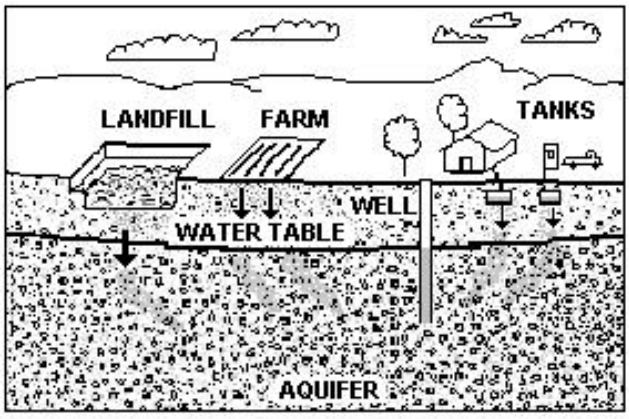

Figure 1: Example of how a well could become contaminated by different land uses and activities.

for additional information regarding the location of the well and activities within the protection areas.

2. Discussion of Land Uses in the Protection Areas

The Zone Is for the wells are in compliance with the DEP Zone I requirements that restrict activities to only those associated with water supply or passive, non-threatening activities. The IWPAs encompass the entire complex including the residential area, the generator fuel oil storage area (inside containment), and septic system components. The facility chlorinates the water prior to distribution.

Key issues include:

1. **Zone I,**
2. **Transportation/parking,**
3. **Nursing Home/Institutional, and**
4. **Aboveground fuel storage.**

Glossary

Zone I: The area closest to a well; a 100 to 400-foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

The overall ranking of susceptibility to contamination for the Nursing Home supply wells is moderate based on the presence of several moderate ranked potentially threatening land uses or activities in the IWPA.

Please refer any questions about water quality at the facility to the contact person listed in Table 1. Continued monitoring and site management is recommended to prevent accidents and minimize threats within the Zone I and IWPA protection areas of the wells.

1. Zone I – The water supplier owns the entire Zone I area and there are only a few parking spaces located within the paved area on the edge of the approved Zone Is. At the time the facility was built, the DEP approved these Zone Is as being in compliance. Systems not meeting DEP Zone I requirements for ownership or control, or that have non-conforming activities within Zone I, must receive DEP approval and address Zone I issues prior to conducting work in Zone I, increasing water use or modifying systems. Systems with conforming Zone Is may not allow threatening activities within the Zone I to occur.

Zone I Recommendations:

- Prohibit any additional activities within Zone I and where feasible remove non-conforming activities within the Zone I areas. Do not allow storage or additional parking in the Zone I area.
- Do not use or store pesticides, fertilizers or road salt within the Zone I.
- Monitor and inspect the wells and pits on a regular basis to ensure the integrity of the caps and seals. Review alternatives for preventing standing water in the well pits and sampling taps for the wells.

2. Transportation corridor/parking – An internal roadway and a few parking spaces are located in the Zone Is. The remainder of the facility and the parking areas are within the IWPA. Storm drains discharge to the city storm system.

Transportation corridor Recommendations:

- Monitor all parking areas and continue to ensure the drainage flows away from the wells.
- Prepare an Emergency Response Plan that includes coordination among the DEP, the Town, and the State Police in the event of an accident near the

For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at: www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

wellhead.

3. Nursing Home/Institutional Land Use – The nursing home is located within the IWPAs. If managed improperly, activities associated with residential/institutional areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include cleaning materials, medications, automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used generally in homes are potential sources of contamination.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site, http://www.state.ma.us/dep/brp/wm/nonpoint.htm for additional information.

Residential Land Use Recommendations:

V Educate staff, particularly maintenance staff on best management practices (BMPs) for protecting water supplies. Focus efforts on management and disposal of cleaning materials and potentially hazardous materials.

4. Aboveground fuel oil storage – There is one diesel AST located adjacent to the building within the IWPA of both wells. A small quantity of petroleum products for maintenance equipment is also stored within the containment structure. If managed improperly, fuel oil tanks and associated fuel lines can be a potential source of contamination due to leaks or spills of the materials they store.

Recommendation:

V Any modifications to the tanks must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs and USTs.
V Continue to monitor all activities associated with the fuel oil especially delivery.
V Have spill containment/absorbent materials available on-site.
V Sleeve all fuel lines that have the potential to leak outside of the containment structure.

4. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. Please review and adopt the key recommendations above and as follows as is feasible:

Priority Recommendations:

V Inspect the wells regularly and ensure there is no standing water in the pits. Consider alternatives to resolve the issue and ensure the integrity of the seals on well caps and sampling taps.

Zone I:

V Prohibit any new non-water supply activities from Zone I.
V Continue regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
V Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- Educate neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal and septic system maintenance.

Planning:

- Request that the City include the IWPA for your and other water systems in the water supply protection district.
- Have a plan to address short-term water shortages and long-term water demands.
- Keep the phone number of a bottled water company readily available in the event of an emergency.
- Supplement the SWAP assessment with additional local information, and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding Sources:
The DEP's Wellhead Protection Grant Program provides funds to assist public water suppliers and their partners in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under this grant program. If funds are available, in the spring, DEP posts a new Request for Response for the grant program (RFR).

These recommendations are only part of your on-going local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet